

## **REMARKS/ARGUMENTS**

Prior to the amendments presented herewith, claims 11-13, 15-25, 27-29, 31, 33-73 and 75-86 were pending. Claims 13, 28 and 31 are being amended. Claims 11, 12, 15-25, 33-73 and 75-86 have been withdrawn. Claims 1-10, 14, 26, 30, 32 and 74 have been cancelled. Accordingly, after the present amendments have been entered, claims 13, 27-29 and 31 will be pending.

### **1. Restriction Requirement**

Claim 13 is being amended to delete the phrase “or two R<sub>12</sub> are taken together to form a ring fused or bridged to the ring formed by J, K, L and M,” as suggested by the Examiner.

Applicants reserve the right to petition for rejoinder under 37 C.F.R. § 1.144 with regard to the non-elected claims, once the elected claims are placed in condition for allowance.

Applicants also reserve the right pursuant to 35 U.S.C. § 121 to file one or more divisional applications directed to the non-elected subject matter during the pendency of the present application.

### **2. Information Disclosure Statements**

Applicants thank the Examiner for indicating that the Forms 1449 filed on 2/12/2007, 2/1/2007, 1/23/2007, 1/8/2007, 11/15/2006, 9/26/2006, 9/7/2006 and 8/15/2006 have been considered.

Please note that two further supplemental Information Disclosure Statements were filed electronically on April 5, 2007 and July 5, 2007, after the mailing date of the present Office Action.

### **3. Claim rejections under 35 USC §102**

Claims 13, 27 and 29 are rejected as allegedly being anticipated by WO 2000/066584 (Guadilliere *et al.*), Lakhan *et al.*, Shyam *et al.*, Tiwari *et al.* and US 7,161,002 (Bergnes *et al.*).

**a. WO 00/066584 (Guadilliere *et al.*)**

With respect to WO 2000/066584, the compound referred to by the Examiner as allegedly anticipating the present claims (3-benzyl-6-bromo-3,4-dihydro-quinazolin-4-one) does not meet the definition of R<sub>2</sub> in the pending claims.<sup>1</sup> With respect to claim 13, the claim is being amended to remove –N(H)- and –N(R<sub>9</sub>)- from the definition of U. In addition, with respect to claim 28, the compounds of Guadilliere *et al.* do not meet the requirements of substituent K. Similarly, with respect to claim 31, the compounds of Guadilliere *et al.* do not meet the requirements of substituent L. Accordingly, the rejection under 35 USC §102 in view of WO 2000/066584 (or US 6,747,035) should be withdrawn.

**b. Lakhan *et al* (*Journal of Indian Chemical Society* (1987), 64 (5), 316-18) and Shyam *et al.* (*Current Science* (1975), 44(16), 562-4)**

In addition, the definition of U in claim 13 is being amended to delete reference to –SCH<sub>2</sub>CH<sub>2</sub>–. With respect to claim 28, the compounds of Lakhan *et al.* and Shyam *et al.* do not meet the requirements of substituent K. Similarly, with respect to claim 31, the compounds of Lakhan *et al.* and Shyam *et al.* do not meet the requirements of substituent L. Accordingly, the rejection with respect to Lakham *et al.* and Shyam *et al.* is believed to be overcome.

**d. Tiwari *et al.* (*Indian of Journal of Pharmaceutical Sciences* (1978), 40(2), 40-3)**

With respect to Tiwari *et al.*, the relevant compound of Tiwari *et al.* does not meet the definition of R<sub>1</sub> in the presently pending claims (*i.e.*, the relevant compound of Tiwari *et al.* does not have R<sub>1</sub>= benzyl). Accordingly, the rejection with respect to Tiwari *et al.* should be withdrawn.

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<sup>1</sup> In addition, the Examiner indicates that US 6,747,035 is equivalent to WO 2000/066584, and proceeds to cite to column 22, lines 32-48 of US 6,747,035 to form the basis of the rejection. However, WO 2000/066584 and US 6,747,035 are **not** equivalent. In fact, US 6,747,035 cites to WO 2000/066584 when describing the synthesis of 3-benzyl-6-bromo-2-hydrazino-3,4-dihydro-quinazolin-4-one (*see* column 22, lines 31-33 of US 6,747,035).

**e. U.S. Pat. No. 7,161,002 (Bergnes *et al.*)**

With respect to Bergnes *et al.*, the definitions of U in claims 13 and 31 are being amended to delete reference to -CHR<sub>9</sub>-. In addition, the compounds described in Bergnes *et al.* do not meet the requirements of substituent K in claim 28. Accordingly, the rejection with respect to Bergnes *et al.* is believed to be overcome.

In light of the foregoing, the rejections of claims 13, 27 and 29 under 35 USC §102 should be withdrawn.

**4. Claim rejections under 35 USC §103**

In making the rejection, the Examiner acknowledges that the compounds of Chenard *et al.* differ from the presently claimed compounds in that the substituents at the 2-position of the quinazolinones of Chenard *et al.* are substituted phenyl rings *and not* benzyl groups, as required by the pending claims. The Examiner then goes on to dismiss these differences as being obvious by alleging that a compound with a benzyl substituent is a homologue of a compound with a phenyl substituent. However, those skilled in the art would understand that “homologues” refer to compounds having a similar general formula that possess similar chemical properties (*see*, [http://en.wikipedia.org/wiki/Homologous\\_series](http://en.wikipedia.org/wiki/Homologous_series), copy attached). Due to the high degree of unpredictability in the chemical arts, those skilled in the art would expect phenyl-substituted quinazolinones and benzyl-substituted quinazolinones (with their methylene linkages between the phenyl ring and the quinazolinone) to have significantly different activities as protein inhibitors. In particular, because the phenyl ring of the benzyl substituent extends out from the quinazolinone further than the phenyl substituent, one would *not* expect the benzyl-substituted quinazolinones and phenyl-substituted quinazolinones to have the same protein inhibition properties. As such, the benzyl-substituted quinazolinones are *not* mere homologues of the phenyl-substituted quinazolinones of Chenard *et al.* Further, Applicants note that Chenard *et al.* is directed to AMPA receptor antagonists and does not suggest DPP-IV activity. In light of the foregoing, the rejection of claims 13, 27-29 and 31 under 35 USC §103 should be withdrawn.

## **5. Claim rejections under 35 USC §112, second paragraph**

Claims 13, 27-29 and 31 are rejected as allegedly being indefinite.

With respect to the terms “aldehyde”, “amide”, “ester”, “imino ketone” and “ketone,” Applicants respectfully submit that those skilled in the art would readily understand that the these terms, when used as part of a Markush group to describe possible substituents, refer to radicals derived from aldehydes, amides, esters, imino ketones and ketones. However, solely for the purpose of advancing prosecution of the present application, claims 13, 28 and 31 are being amended to recite that the substituents include “monovalent radicals derived from aldehydes, amides, esters, imino ketones and ketones.”

With respect to the term “oxo,” inclusion of radicals derived from aldehydes and ketones obviates the need for the term “oxo” in the list of possible substituents. Accordingly, claims 13, 28 and 31 are also being amended to delete reference to oxo in the Markush groups.

Claims 13, 28 and 31 are being amended to replace the term “comprising” with the term “selected from the group consisting of” or the term “having,” in accordance with the Examiner’s suggestion.

Claims 13, 28 and 31 are being amended to replace the term “thio” with the term “monovalent radicals derived from thiols,” in accordance with the Examiner’s suggestion

Accordingly, the rejections under 35 USC §112, second paragraph, are believed to be overcome.

## **6. Miscellaneous Claim Amendments**

Claims 28 and 31 are being amended to be in independent form.

## **7. Double Patenting**

The Examiner has provisionally rejected claims 13, 27-29 and 31 under the doctrine of non-statutory obviousness-type double patenting as being unpatentable over select claims of copending Application Nos. 10/809,636; 10/809,635; and 10/809,638. Since the rejection is provisional, Applicants intend to address the rejection when one or both of the applications are otherwise in condition for allowance.

## CONCLUSION

Applicants earnestly believe that they are entitled to a letters patent, and respectfully solicit the Examiner to expedite prosecution of this patent application to issuance. Should the Examiner have any questions, the Examiner is encouraged to telephone the undersigned.

Respectfully submitted,

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# Homologous series

From Wikipedia, the free encyclopedia

In chemistry, a **homologous series** is a series of organic compounds with a similar general formula, possessing similar chemical properties due to the presence of the same functional group, and shows a gradation in physical properties as a result of increase in molecular size and mass (see relative molecular mass). For example, ethane has a higher boiling point than methane since it has more Van der Waals forces with neighbouring molecules. This is due to the increase in the number of atoms making up the molecule. Organic compounds in the same homologous series vary by a  $\text{CH}_2$ .

Alkanes (paraffins), alkenes (olefins), methoxyethane (ethers), and alkynes (acetylenes) form such series in which members differ in mass by 14, 12, and 10 atomic mass units, respectively. For example, the alkane homologous series begins with methane ( $\text{CH}_4$ ), ethane ( $\text{C}_2\text{H}_6$ ), propane ( $\text{C}_3\text{H}_8$ ), butane ( $\text{C}_4\text{H}_{10}$ ), and pentane ( $\text{C}_5\text{H}_{12}$ ), each member differing from the previous one by a  $\text{CH}_2$  group (or 14 atomic mass units).

Similarly, there is the alcohol homologous series that starts with methanol ( $\text{CH}_3\text{O}$ ), ethanol ( $\text{C}_2\text{H}_5\text{O}$ ), as primary alcohols, isopropanol ( $\text{C}_3\text{H}_8\text{O}$ ) as a simple secondary alcohol, and a simple tertiary alcohol is tert-butanol ( $\text{C}_4\text{H}_{10}\text{O}$ ).

Even while the *general formula* are the same, they have different structures that can lead to the exact same compound to different properties, although they will always present the same chemical properties while as a homologous compound.

Compounds in each set have the same little group of atoms called the functional group. Most **chemical properties** of organic compounds are due to the presence of the functional group.

Homologous series	General formula	Example	Functional group
Alkanes	$\text{C}_n\text{H}_{2n+2}$ ( $n$ more than or equal to 1)	$\text{CH}_4$ , $n = 1$	
Alkenes	$\text{C}_n\text{H}_{2n}$ ( $n$ more than or equal to 2)	$\text{C}_2\text{H}_4$ , $n = 2$	$\text{C} = \text{C}$
Alkynes	$\text{C}_n\text{H}_{2n-2}$ ( $n$ more than or equal to 2)	$\text{C}_2\text{H}_2$ , $n = 2$	$\text{C} \equiv \text{C}$
Alcohols	$\text{C}_n\text{H}_{2n+1}\text{OH}$ ( $n$ more than or equal to 1)	$\text{CH}_3\text{O}$ , $n = 1$	$-\text{OH}$
Carboxylic acids	$\text{C}_n\text{H}_{2n}\text{CO}_2\text{H}$ ( $n$ more than or equal to 1)	$\text{CH}_3\text{COOH}$ , $n = 1$	$-\text{COOH}$

Where  $n$  represents the number of carbon atoms present.

A Homologation reaction is any chemical process converting one member of a homologues series to the next.

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Category: Organic chemistry

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